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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,852	12/05/2005	Richard Perkins	853463.466USPC	2095

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EXAMINER	
TRAN, PABLO N	

ART UNIT	PAPER NUMBER
2618	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/560,852	PERKINS, RICHARD	
	Examiner	Art Unit	
	Pablo N. Tran	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) *4,5,13 and 14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 6-12, and 15-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 6-12, and 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haub et al. (hereinafter "Haub", US Pat. No. 6,944,427) in view of Zhang (US Pat No 6,154, 641) and further in view of Tokuda et al. (hereinafter "Tokuda", US Pat No 6,035,213).

As per claim 1, Haub disclose a method of reducing the effects of intermodulation distortion in a zero-IF receiver comprising receiving an RF signal, modulating the RF signal to provide one or more baseband signals, detecting an occurrence of intermodulation distortion within the one or more baseband signals, and selectively enabling a wide-notch filter to attenuate signal components of the one or more baseband signals within a predetermined mode frequency range of the wide-notch filter to reject the inter-modulation, wherein detecting the occurrence of the inter-modulation distortion comprises determining a plurality of signal strength measures, and determining the occurrence of inter-modulation distortion based on a relationship

among the plurality of signal strength measures (fig. 3-6, col. 6/ln. 62-col. 7/ln. 19, col. 7/ln. 20-col. 8/ln. 38, col. 9/ln. 51-col. 10/ln. 56).

Haub disclose such method to suppress or reject high-order inter-modulation but not explicitly for second-order inter-modulation. However, such method to reject second-order inter-modulation is well known in the art, as taught by Zhang (col. 2/ln.38-43, col. 4/ln. 51-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention for Haub to utilize such method in order to effectively suppress unwanted inter-modulation components of the desired channels.

The modified communication system of Haub and Zhang does not disclose that the wide notch filter having various modes. However, Tokuda teaches such a receiver that incorporates a variable notch filter to suppress intermodulation (see fig. 8/no. 105, fig. 12/no. 105, fig. 13/no. 108, and col. 3/ln. 5-col. 4/ln. 51). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention for the modified communication system of Haub and Zhang to incorporate such a notch filter, as taught by Tokuda, to effectively suppressing disturbing signals.

As per claims 2 and 11, the modified communication system of Haub and Zhang in view of Tokuda further disclose the predetermined wide-notch is approximately +/-60 kHz, and approximately centered at zero-Hertz (see Haub, fig. 4, fig. 6).

As per claim 3, the modified communication system of Haub and Zhang in view of Tokuda further disclose detecting a cessation of the intermodulation distortion, and selectively disabling the wide mode of the notch filter , based on the cessation of the

intermodulation distortion (see Tokuda, col. 8/ln. 42-56, col. 9/ln. 16-30, col. 9/ln. 44-60).

As per claim 6, the modified communication system of Haub and Zhang in view of Tokuda further disclose selectively disabling the wide mode of the wide-notch filter when the Eb/Nt measure substantially increases (see Tokuda, col. 8/ln. 42-56, col. 9/ln. 16-30, and col. 9/ln. 44-60).

As per claim 7, the modified communication system of Haub and Zhang in view of Tokuda further disclose an RSSI measure, and an RF energy measure; and determining the occurrence of intermodulation distortion if the RSSI measure is below a first threshold value when the RF energy measure is above a second threshold value (see Haub, col. 7/ln. 20-col. 8/ln. 38, col. 9/ln. 51-col. 10/ln. 56, see Tokuda, col. 6/ln. 24-col. 7/ln. 16).

As per claim 8, the modified communication system of Haub and Zhang in view of Tokuda further disclose a first measure of energy in a first frequency band of the one or more baseband signals, and a second measure of energy in a second frequency band of the one or more baseband signals, the second frequency band being higher than the first frequency band; and determining the occurrence of intermodulation distortion if the first measure of energy is substantially higher than an estimated first measure of energy corresponding to the second measure of energy absent intermodulation distortion (see Haub, col. 7/ln. 20-col. 8/ln. 38, col. 9/ln. 51-col. 10/ln. 56, see Tokuda, col. 6/ln. 24-col. 7/ln. 16).

As per claim 9, the modified communication system of Haub and Zhang in view of Tokuda further disclose disabling the wide mode of the wide-notch filter based on a duration since enabling the wide mode of the wide-notch filter (see Tokuda, col. 8/ln. 42-56, col. 9/ln. 16-30, col. 9/ln. 44-60).

As per claim 10, Haub disclose a mixer that is configured to convert a received RF signal to an analog baseband signal, a detector that is configured to assert a detection signal when intermodulation distortion is detected in the analog baseband signal, a filter, operably coupled to the mixer and the detector, that is configured to selectively attenuate signal components in the analog baseband signal when the detection signal is asserted, and a baseband processor that is configured to receive the analog baseband signal and to provide therefrom a receiver output (fig. 3, fig. 5).

Haub disclose such method to suppress or reject high-order inter-modulation but not explicitly for second-order inter-modulation. However, such method to reject second-order inter-modulation is well known in the art, as taught by Zhang (col. 2/ln.38-43, col. 4/ln. 51-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention for Haub to utilize such method in order to effectively suppress unwanted inter-modulation components of the desired channels.

The modified communication system of Haub and Zhang does not disclose that the wide notch filter having various modes. However, Tokuda teaches such a receiver that incorporates a variable notch filter to suppress intermodulation (see fig. 8/no. 105, fig. 12/no. 105, fig. 13/no. 108, col. 3/ln. 5-col. 4/ln. 51). Therefore, it would have been

obvious to one of ordinary skill in the art at the time of invention for the modified communication system of Haub and Zhang to incorporate such a notch filter, as taught by Tokuda, to effectively suppressing disturbing signals.

As per claim 12, the modified communication system of Haub and Zhang in view of Tokuda further disclose the detector is further configured to de-assert the detection signal to activate the normal mode of the wide-notch filter based on a duration since asserting the detection signal (see Tokuda, col. 8/ln. 42-56, col. 9/ln. 16-30, col. 9/ln. 44-60).

As per claim 15, the modified communication system of Haub and Zhang in view of Tokuda further disclose the detector de-asserts the detection signal to activate the normal mode of the wide-notch filter when the Eb/Nt measure substantially increases (see Tokuda, col. 8/ln. 42-56, col. 9/ln. 16-30, and col. 9/ln. 44-60).

As per claim 16, the modified communication system of Haub and Zhang in view of Tokuda further disclose the detector is configured to detect the intermodulation distortion in the analog baseband signal based on: a first measure of signal strength in the analog baseband signal, and a second measure of signal strength in the received RF signal; and the detector asserts the detection signal for activating the wide mode of the wide-notch filter when the first measure is below a first threshold value and the second measure is above a second threshold value (see Tokuda, col. 8/ln. 42-56, col. 9/ln. 16-30, col. 9/ln. 44-60).

As per claim 17, the modified communication system of Haub and Zhang in view of Tokuda further disclose the detector is configured to detect the intermodulation

distortion in the analog baseband signal based on: a first measure of energy in a first frequency band of the analog baseband signal, and a second measure of energy in a second frequency band of the analog baseband signal, the second frequency band being higher than the first frequency band; and the detector asserts the detection signal for activating the wide mode of the wide-notch filter when the first measure of energy is substantially higher than an estimated first measure of energy corresponding to the second measure of energy absent intermodulation distortion (see Tokuda, col. 8/ln. 42-56, col. 9/ln. 16-30, col. 9/ln. 44-60).

As per claim 18, the modified communication system of Haub and Zhang in view of Tokuda further disclose the baseband processor is further configured to provide the first and second measures of energy to the detector (see Haub, col. 7/ln. 20-col. 8/ln. 38, col. 9/ln. 51-col. 10/ln. 56, see Tokuda, col. 6/ln. 24-col. 7/ln. 16).

As per claim 19, the modified communication system of Haub and Zhang in view of Tokuda further disclose the received RF signal is a quadrature-modulated signal, and the mixer is configured to provide a pair of quadrature signals that comprise the analog baseband signal (see Haub, fig. 1).

As per claim 20, the modified communication system of Haub and Zhang in view of Tokuda further disclose the filter is a digital filter that is included within the baseband processor (see Haub, fig. 3, fig. 5).

As per claim 21, the modified communication system of Haub and Zhang in view of Tokuda further disclose wherein the plurality of signal strength measures comprise an RSSI measure and an Eb/Nt measure, and determining the occurrence of inter-

modulation distortion comprises determining if the Eb/Nt measure is below a first threshold value when the RSSI measure is above a second threshold value (see Haub, fig. 2, fig. 4, fig. 6, col. 7/ln. 20-col. 8/ln. 38, col. 9/ln. 51-col. 10/ln. 56).

As per claim 22, the modified communication system of Haub and Zhang in view of Tokuda further disclose wherein the digital measures of signal strengths comprise an RSSI measure and an Eb/Nt measure; and the detector asserts the detection signal when the Eb/Nt measure is below a first threshold value and the RSSI measure is above a second threshold value (see Haub, fig. 2, fig. 4, fig. 6, col. 7/ln. 20-col. 8/ln. 38, col. 9/ln. 51-col. 10/ln. 56).

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pablo Tran whose telephone number is (571)272-7898. The examiner normal hours are 9:30 -5:00 (Monday-Friday). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban, can be reached at (571)272-7899. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

4. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) System. Status information for Published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see httpr//pair-directauspto.gov. Should

You have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (in USA or CANADA) or 571-272-1000.

June 20, 2009

/Pablo N Tran/
Primary Examiner, Art Unit 2618